EFOMP COMPANY MEMBER ARTICLE

IBA: Proactive Risk Management in Radiation Oncology: from Burden to Value

Multi-professional healthcare teams use proactive risk management (RM) to analyse probable patient treatment failures and execute "safety measures" to prevent mishaps. IBA Dosimetry software for proactive risk management is myQA Proactive. This article shows how it solves FMEA spreadsheet flaws and facilitates AAPM TG100 [1] implementation so every clinic may manage risks with a positive effort balance.

Proactive risk management

Proactive risk management (RM) is a methodology used by a multi-professional clinical team to assess potential patient treatment failures, with the goal of defining and deploying the “safety measures” necessary to prevent incidents. There are several good reasons to perform proactive RM:

- It is mandatory in European countries, which translated the EU-Directive 2013/59Euratom into national regulation, or it is the preferred tool to become compliant.
- It is a fundamental component of quality management best practice in radiation oncology [2]-[5], being the ideal complement to retrospective RM (incident report and learning).
- It optimizes workflow (patient pathways and QA) and maximizes the level of safety achievable with limited resources [1].

We discovered with a worldwide survey that the benefits of proactive RM are well understood, but the lack of supporting tools inhibits its adoption. Until now, the most common solution has been a spreadsheet-based FMEA approach, which makes RM time consuming and difficult to manage, causing many clinics to stay away from proactive methods.

myQA PROactive, a flexible solution

myQA PROactive is a comprehensive IBA Dosimetry software solution for proactive RM. It solves shortcomings of FMEA spreadsheets and facilitates the implementation of guidelines like AAPM TG100 [1], so that every clinic can manage risks with a positive effort balance: time gained with workflow improvements outweighs time spent on RM.
First, efficiency is boosted:

- Everything is fully optimised for clinics, including user and data management, version control, and comprehensive and configurable reporting. The flexibility of a web-based application allows covering different hospital sizes, structures, and RM procedures (e.g., remote cooperation).
- Any risk analysis can be based on a template. Although it is possible to start from scratch or import a clinic’s FMEA spreadsheet, templates based on literature and common practice are provided with the software. They include typical workflow steps, failure modes, and safety measures for the most usual treatment modalities.
- Each clinical workflow can be modelled with a flowchart (Fig.1), which is a more versatile and intuitive alternative to a list of steps. The flowchart and lists are automatically synchronised by the application.
- Failure modes can be organized either according to their occurrence step (FMEA method), or according to their effect, thus highlighting the causation chain with a fault tree (FTA method, Fig. 2). These two methods are complementary. FMEA answers the questions: What are we doing? What could be done wrong? It is systematic and easy to learn, but time consuming. FTA answers the questions: What could happen to the patient? How could it happen? It is extremely time effi-

cient and focused on major risks. FMEA and FTA views are automatically synchronized, and the user can at any time effortlessly switch between them [6].

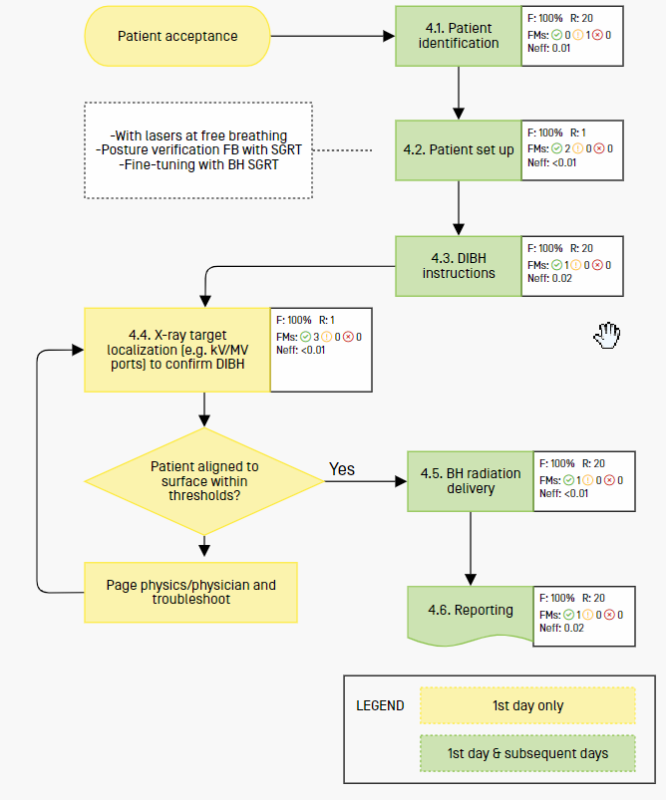

Figure 1. Example of a flowchart for the "Treatment" step of the SGRT Breast Breath-Hold [8] process.

Second, a tangible risk metric is introduced: the expected event rate due to a potential failure (expressed in patients/year). It allows for an objective risk evaluation and creates greater confidence in the results. It is automatically calculated based on failure modes' occurrence and detectability, and on a few workflow data points. Event rate is combined with failure mode severity to assess risk tolerability through an intuitive risk matrix approach.

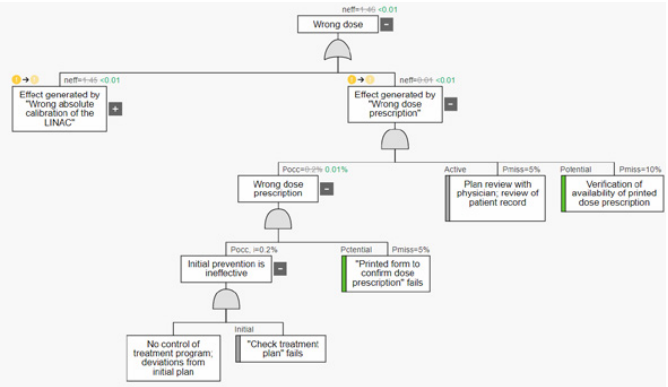

Figure 2. Example of fault tree for SGRT Breast Breath-Hold with top event "wrong dose" [8].

Third, myQA PROactive helps the user take the decisions needed to optimise the workflow. Alternative safety measures can be compared with what-if scenarios and a cost-benefit analysis, which summarizes the event rate reduction offered by the safety measures as well as their cost.

During development, myQA PROactive was extensively tested by more than 20 clinics worldwide to ensure outstanding usability and verify that the desired benefits are delivered to the user [7], [8]. A trial version is available for interested clinics.

References:

[1] Saiful M. Huq et al., Med. Phys. 43 (2016): 4209.
[2] ICRP Publication 112. Ann. ICRP 39 (4), 2009.
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[4] "Radiotherapy Risk Profile- Technical Manual," WHO, 2008.
[5] Technical Supplement to Radiation Protection no. 181 (2015).
[6] Patent application, no. EP22153965.
[7] Dominik Kornek, "myQA PROactive Risikomanagement: Von der Last zum Mehrwert," DGMP 2022, Aachen, 22 September 2022 (IBA lunch Symposium).
[8 Serenella Russo et al., "FMEA risk analysis of surface-guided DIBH breast radiotherapy by using a commercial software tool," in preparation.

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